

REMARKS

Applicants have considered carefully the Examiner's rejections and reasons therefore set forth in a Final Office Action mailed December 22, 2005. By this Amendment a number of claims have been amended. Some of the claims have been canceled to reduce the number of outstanding issues. As explained below, the pending claims are all allowable over the prior art.

Considering first of all amended claim 19 which has been rewritten in independent form, in rejecting claim 19, the Examiner has failed to establish a proper *prima facie* case of obviousness. Claim 19 includes the following limitation which the rejection has failed to properly address:

"providing pre-set laser modules for installation in a network where the number of optical spans between a module and a respective receiver is not larger than a predetermined exponent." (pending claims 19, 20)

The Examiner has acknowledged that Chraplyvy et al.:

"does not specifically teach to provide pre-set laser modules for installation in a network where the number of optical spans (S) between a module and a respective receiver is not larger than a predetermined exponent." (Office Action, page 7)

In attempting to obviate the deficiency in Chraplyvy et al. the Examiner referred to Zyskind stating that"

"Zyskind discloses that the total gain of 13 amplifiers is the product of the individual gain of each of the 13 amplifiers (fig. 2.8)" (Office Action, pg. 7)

However, Zyskind is cumulative and adds nothing to the primary patent document Chraplyvy et al. Chraplyvy et al. provides a particular form of a solution, different from the claimed solution, to a problem set forth by Zyskind. Both of these documents suggest adjusting the gain of the transmitters of individual channels. Zyskind merely teaches that there is a benefit to adjusting the gain of a plurality of transmitters in accordance with amplifier characteristics. Chraplyvy et al. discloses a particular way in which that gain may be adjusted using feedback

between the receiving end of the optical system and the transmitting end. Modularity of transmitters is not addressed in either document.

The Examiner has seized upon Chen et al. in an attempt to remedy the acknowledged defects in Chraplyvy et al. whether considered alone or in combination with Zyskind. Chen et al. however is quite different in that Chen et al. couples an optical flattening filter to the output of each amplifier to continually attempt to maintain uniform output power. This approach is clearly illustrated in Fig. 2 of Chen et al. Chen et al. simply do not address the transmission profile of signals being coupled to the optical system. Chen et al. does not address modular transmitters.

It is submitted that pending claim 19 is not made obvious to one of ordinary skill in the art by the Examiner's combination of Chraplyvy et al., Zyskind and Chen et al. We note that none of the documents in question refers to or in any way suggests "providing pre-set laser modules for installation and in a network" as claimed. Rather, the teaching of the combination suggested by the Examiner is to incorporate gain flattening filters at the output of respective amplifiers in combination with the feedback circuitry of Chraplyvy et al. The Examiner's obviousness conclusion is not supported by the combination suggested in the Office Action for at least the above reasons.

A proper *prima facie* case of obviousness requires that the Examiner identify a particular suggestion, motivation or teaching in one or more of the prior art documents which suggests modifying Chraplyvy et al. in a way so as to make the claimed structure or method obvious. Not only has no such suggestion, teaching or motivation been identified, the combination proposed by the Examiner in fact teaches away from the claimed structure for at least the above reasons.

In rejecting claim 20, which depends on claim 19, the Examiner has inaccurately stated:

"applicant has not disclosed that having the laser modules each having substantially the same power output profile solves any stated problem or is for any particular purpose to have the laser modules each having substantially the same power output profile." (Page 8, Office Action, 1st paragraph)

Applicants stated on page 5 third full paragraph of the present application the following:

"In yet another embodiment, networks can be formed of a plurality of substantially identical preset transmitter modules which can be coupled to up to a

predetermined maximum number of cascaded spans. The preset transmitter modules provide assurance that the down stream optical receivers receive signals from the network which do not exceed their respective input sensitivity ranges. Thus, no field adjustments or settings are necessary. Paths can be added to the network with up to the selected maximum number of spans without further adjustments to the pre-emphasis circuitry."

Applicants have made clear the advantage of this embodiment of the invention. Minimizing or eliminating any need for field adjustments or settings is a substantial advantage. Additionally, the ability to couple paths together up to a selected number of spans without further adjustments to the pre-emphasis circuitry is also advantageous.

The Examiner's rejection of claim 20 is based on an improper "obvious matter of design choice" rationale. The Federal Circuit has made clear that "design choice" is not a proper basis for an obviousness rejection. The only basis for an obviousness rejection is that set forth based on 35 USC § 103(a) as interpreted by the Courts. In this consideration, the nature and content of the prior art must be considered, the level of skill in the prior art is considered, and the differences between the prior art and the claimed structure are evaluated. The prior art must suggest the desirability of the claimed invention. Merely referring, as the Examiner has done in the rejection of claim 20 "an obvious matter of design choice" is insufficient to establish a proper *prima facie* case of obviousness. For at least the above reasons claims 19 and 20 are both allowable.

Claim 25 has been amended so as to incorporate the limitation of claim 29. In attempting to establish a rationale for rejecting claim 29 on page 9 of the Office Action the Examiner stated:

"it would have been obvious for one of ordinary skill in the art at the time of the invention was made to select a receiver having a proper sensitivity range, including on the order of 2S dB for a particular network to meet the particular requirement for the network."

The above rejection is insufficient in that it asserts that the claimed invention is within the capabilities of one of ordinary skill in the art. This has clearly been rejected as a rationale for establishing a proper *prima facie* case of obviousness. Pending claim 29 (now amended claim

25) requires that "the receiver has an input sensitivity range on the order of 2S dB. Also as is made clear by the claim, "less than S optical links extend between the plurality of transmitters and the receiver".

Any receiver with an input sensitivity range which is less than or which exceeds 2S dB could be selected and used by one of skill in the art with the network of Chraplyvy et al. The feedback system of Chraplyvy et al. is quite independent of the number of optical spans between transmitters and receiver; and receiver characteristics are not associated with the number of spans. This is not the claimed invention.

None of Chraplyvy et al., Zyskind or Chen et al. provide the required suggestion, motivation or teaching to modify Chraplyvy et al. so as to make claim 29 obvious. Chraplyvy et al. do not address receiver input ranges, nor do Zyskind or Chen et al. It is not an issue for them as the feedback system of Chraplyvy et al. provides substantially constant output power as illustrated in Figs. 5 and 6 thereof. In this regard, Chraplyvy et al. state:

"Thus, it can be stated that the signal for each channel is fine tuned by recalculating and applying the relationship a second time. Fig. 5 is a plot of P_{out} (the power out) relative to wavelength after relationship A has been recalculated and applied a second time. At this time, the output power variations are 0.12 dB. Recalculating and applying the relationship a third time equalizes the various output powers to within 0.01 dB. See Fig. 6." (Chraplyvy et al. Col. 4, ln 65-Co. 5, ln 5)

Thus, the prior art teaches a selection of receivers with input sensitivity ranges which are quite independent of the number of lengths in the span between the transmitter and the receiver. This is quite unlike the claimed structure. For at least the above reasons claim 29 is allowable.

The rejections of pending claims 32-37 fail to comply with office standards for establishing a *prima facie* case of obviousness. We first note that Sundelin is completely silent relative to amplifier based gain variations. Sundelin uses amplifiers 65 and 67 which adjust incoming signals to a "suitable power level" (Sundelin Col. 5, ln 17). In this regard:

"the power level is adapted, so that the individual power levels of the channels to be added are as equal as possible to those of the channels continuing

substantially uninterrupted through the node 7 from one line cable 1,13 to the opposite one 13,1 (Sundelin Col. 5, ll 17-22)

The above make it clear that Sundelin is not concerned with amplifier based gain variations. Rather, his structure focuses merely on attempting to provide common power levels for signals to be added. Further in attempting to establish a rationale for rejecting the pending claims the Examiner stated:

"it is well known in the art to use a pre-set pre-emphasis module to control and limit the input signals." (Page 12 Office Action)

However, no citation to support this assertion has been provided by the Examiner. Wilner as admitted by the Examiner uses "a dynamic pre-emphasis module" which functions to provide uniform power output levels for different channels prior to retransmitting the respective channel on an optical link. Wilner et al. also does not address wavelength dependent characteristics of downstream amplifiers.

Further, the Examiner has also stated on page 12 of the Office Action, without support, that it is:

"well known in the art that a dynamic pre-emphasis module can be used as a static pre-emphasis module and pre-set the emphasis values."

Such unsupported assertions are not in keeping with the requirement that the cited prior art of record. In this case Sundelin in view of Wilner et al. do not provide the required motivation, suggestion or teaching to modify Sundelin so as to make the subject claim obvious. Rather, the Office Action is based on two different "it is well known in the art" assertions made without support to then lead to a conclusion, without identifying any particular suggestion, motivation or teaching to argue the obviousness of the limitation which requires:

"the module being useable to limit incoming optical signals to the predetermined input range when used with up to a predetermined number of optical links to be determined, at least in part, by the common input range."
(Pending claims 32-37)

The above assertions clearly fail to conform to the standard required to establish a proper *prima facie* case of obviousness.

What is taught by Sundelin in view of Wilner et al. is unlike the claimed structure. That combination merely provides for "equalizing the power of each channel" (Wilner et al. Col. 7, ll 60,61) at the power amplifier 43, 45 of Sundelin. That is inconsistent with and does not make obvious the claimed structure. The number of links, and need to limit that number, as claimed is a non-issue where Sundelin and Wilner et al. focus on channel equalization. Claims 33-37 depend on claim 32 and add additional structure not suggested, disclosed or made obvious by the prior art of record.

The rejections of claims 33-37 fail to consider the claims as a whole. In claim 33 the members of the plurality modules have characteristics set forth in independent claim 32. In particular, the members each:

"limit incoming optical signals to the predetermined input range when used with up to a predetermined number of optical links, determined, at least in part, by the common input range." (pending claims 32-37)

Absent the present application, nothing in Sundelin or Wilner et al. alone or in combination suggests modifying Sundelin as claimed. Sundelin does not address limitations based on the number of spans as claimed. Nor does Wilner et al. Similar comments apply to the rejection of claim 34. Hindsight reconstruction is not a proper basis for an obviousness rejection.

Relative to claims 35-37 each of Sundelin and Wilner et al. focus on equalizing the channels in the system. As pointed out by Sundelin:

"the power per channel in the added signal must have approximately the same level as the power of each passing channel, at the entrance of the add coupler. This is achieved by providing an extra optical amplifier in the input line to the add coupler, on which the light signal carrying the added channels are fed to the add coupler." (Sundelin Col. 2, ln 62-Col. 3, ln 1)

Wilner et al. focuses on:

"equalizing the power of each channel C_1 - C_n at the module output 20."
(Wilner et al. Col.7, ll 60,61)

In rejecting claims 35-37 the Examiner has concluded obviousness without identifying the required suggestion, motivation or teaching which would cause one of ordinary skill in the art to modify Sundelin so as to make any of claims 35-37 obvious. More particularly, the Office Action has failed to identify the respective teaching, suggestion, or motivation relative to particular wording such as:

"the pre-emphasis modules each incorporate channel based characteristics in accordance with an inverse of at least one of the common gain profiles."
(Pending Claim 35)

"the gain characteristics are in accordance with an inverse of both of the common game profiles." (Pending Claim 36)

"the gain characteristics of the modules are in accordance with an inverse of at least one of the common game profiles raised to the predetermined number of optical lengths." (Pending Claim 37)

An obviousness rejection is improper without an identification of the motivation which would cause one of ordinary skill in the art to modify the primary prior art document, in this case Sundelin. Since neither Sundelin nor Wilner et al. address cumulative optical gain variations as claimed, the only suggestion to modify Sundelin so as to make any of pending claims obvious comes from the present application, another example of hindsight reconstruction.

It is believed that pending claims 32-37 are in compliance with the patent statute and particularly 35 USC § 112 ¶2. Relative to the Section 3 rejection of pending claims 32-37 the Examiner's attention is directed to the second and third full paragraphs on page 7 of the pending application as well as Fig. 2, 3 and 4 thereof which are discussed in those two paragraphs. It is believed that those two paragraphs and noted figures make it clear what "gain profile" the module establishes, as well as how "the gain" of the signals "is adjusted in accordance with the predetermined profile" as claimed in claims 32-37. It is requested that this rejection be withdrawn.

Appl. No. 10/075/067

Amendment C

Reply to Final Office Action mailed Dec. 22, 2005

For at least the above reasons the pending claims are allowable. Applicant's attorney would like to conduct a telephone interview with the Examiner to discuss the outstanding Office Action, the pending claims and the prior art. The undersigned will call shortly to discuss scheduling an interview with the Examiner.

Respectfully submitted,

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